

## WHAT IS CLAIMED IS:

1. An ATM-PON (Asynchronous Transfer Mode Passive Optical Network) dual system providing a reliable service by dualizing intervals between optical couplers and ONUs (Optical Network Units), comprising:

5 a control information loading means which loads switch controlling information to a fixed area of a format transmitted and received between an OLT and the ONUs; and

a switch controlling means which switches to each of a VP or a VC on the basis of said switch controlling information.

2. The ATM-PON dual system as claimed in claim 1, wherein said switch controlling means is characterized in deciding necessity of switching by referring to K1/K2 byte areas of a PLOAM (Physical Layer OAM) cell for a monitor transmitted and received between the OLT and the ONUs.

3. An OLT, which is used for an ATM-PON, comprising a frame structuring means which loads SC (Switch Confirmation requirement) signals and SR (Switch Requirement) signals to unused K1 or K2 byte of a message area within a PLOAM cell, and a switch 5 requirement transmitting means which requires line switch of ONUs by using K1/K2 bytes.

4. The OLT as claimed in claim 3, comprising:

a PLOAM cell transmitter/receiver, a PLOAM cell being used for monitoring and being transmitted and received between the OLT and the ONUs;

5 a dualized line termination device loading a PST message transmitter/receiver, which loads and divides switch controlling

information to K1/K2 byte areas of said PLOAM cell; and

a VP/VC (Virtual Path/Virtual Channel) switch which switches a relevant VP or VC on the basis of said K1/K2 byte information.

5. An ONU, which is used for an ATM-PON, being configured by dualizing the interval between said ONU and an OLT, comprising:

two line termination devices which terminate each line;

a transmitting means which allocates signals from subscribers

5 to said two line termination devices and transmits to said OLT;

a receiving means which receives signals transmitted from the OLT at each line termination device; and

a selector which selects either one of signals.

6. The ONU as claimed in claim 5, further comprising a switch deciding means which decides necessity of switching the ONU according to existence of switch controlling information received at each line termination device from the OLT.

7. The ONU as claimed in claim 6, characterized in that said switch deciding means makes a decision on the basis of a precedently determined status transition table.

8. An ATM-PON dual system including an OLT, which is used for an ATM-PON, having a frame structuring means which loads SC signals and SR signals to unused K1 or K2 byte of a message area within a PLOAM cell, and a switch requirement transmitting means

5 which requires line switch of ONUs by using K1/K2 bytes, an ONU, which is used for an ATM-PON, being configured by dualizing the interval between said ONU and an OLT, having two line termination devices which terminate each line, a transmitting means which allocates

signals from subscribers to said two line termination devices and  
10 transmits to said OLT, a receiving means which receives signals  
transmitted from the OLT at each line termination device, and a selector  
which selects either one of signals, and a plurality of optical couplers,  
being configured with a redundant interval between said OLT and said  
ONU, and selecting data at said ONU transmitted from said OLT,  
15 comprising:

a switch controlling means which controls switching of said redundant system by using switch controlling information loaded on a fixed place of a frame format transmitted and received between said OLT and said ONU.

9. An ATM-PON dual method providing a reliable service, comprising the steps of:

dualizing an interval between an optical coupler and an ONU and loading switch controlling information to K1/K2 byte areas of a PLOAM cell for a monitor, which is transmitted and received between an OLT and the ONU; and

switching a relevant VP or VC on the basis of said switch controlling information.

10. The ATM-PON dual method as claimed in claim 9, comprising the steps of:

loading SC signals and SR signals to unused K1 or K2 byte of a message area within a PLOAM cell; and

5 requiring line switch of the ONUs by using said K1/K2 bytes.

11. The ATM-PON dual method as claimed in claim 10, comprising the steps of:

allocating signals from subscribers to said two line termination

devices at the ONU and transmitting to said OLT;

5 receiving signals transmitted from said OLT at each line termination device; and

selecting signals of said line termination device.

12. The ATM-PON dual method as claimed in claim 10, comprising a step of deciding necessity of switching the ONU according to existence of switch controlling information received at each line termination unit from the OLT.

13. The ATM-PON dual method as claimed in claim 10, characterized in that said switch deciding step makes a decision on the basis of a precedently determined status transition table.

14. The ATM-PON dual method as claimed in claim 10, comprising the steps of:

5 broadcasting a frame containing a PLOAM cell which loads said switch controlling information to all of the ONUs connected to downstream; and

deciding switch of a system within a relevant ONU according to existence of 0-system/1-system of switch controlling information of a PLOAM cell obtained from a frame by said each ONU.

15. The ATM-PON dual method as claimed in claim 10, comprising the steps of:

5 transmitting a frame containing a PLOAM cell which loads said switch controlling information to a specified ONU connected to downstream; and

deciding switch of a system within a relevant ONU according to existence of 0-system/1-system of switch controlling information of a

PLOAM cell obtained from a frame by said each ONU.

16. The ATM-PON dual method as claimed in claim 10, comprising the steps of:

allocating signals from subscribers to said two line termination devices at said ONU and transmitting to said OLT;

5 receiving signals broadcasted from said OLT at each line termination device; and

selecting signals of said line termination device.

17. An ATM-PON dual method monitoring status of an interval between an OLT and an ONU by using a PST message, comprising the steps of:

transmitting switch confirmation requirement signals to an ONU connected to downstream all together in case of detecting a line switching trigger at said OLT; and

deciding necessity of switching a system at an ONU receiving said switch confirmation requirement signals and switching only a system of an ONU deciding that switching is necessary.

18. An ATM-PON dual method monitoring status of an interval between an OLT and an ONU by using a PST message, comprising the steps of:

transmitting switch confirmation requirement signals to an ONU connected to downstream all together in case of detecting a line switching trigger at said OLT;

deciding necessity of switching a system at an ONU receiving said switch confirmation requirement signals and returning switch confirmation reply signals to the OLT; and

10 switching only a system of an ONU deciding that switching is

necessary.

19. The ATM-PON dual method as claimed in claim 17, characterized in that said ATM-PON contains a single system ONT partially, and said ONT does not process relevant signals even if receives switch confirmation requirement signals received from the OLT.

20. The ATM-PON dual method as claimed in claim 18, characterized in that said ATM-PON contains a single system ONT partially, and said ONT does not process relevant signals even if receives switch confirmation requirement signals received from the OLT.

21. An ATM-PON dual method containing optical couplers branching and connecting an OLT and a plurality of ONUs, being configured with a redundant interval between said ONU and said optical couplers, and receiving data at each ONU transmitted from said OLT, characterized in switching output lines by an optical switch provided at an output side of an ONU of said optical coupler.

9  
8  
7  
6  
5  
4  
3  
2  
1  
5